Matheus Luís Bernardi

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Portfolio | GitHub | LinkedIn

Professional Experience

Software Developer | MAX IV Laboratory, Lund, Sweden

July 2025 - Present

- Developing mission critical software used at the macromolecular crystallography (MX) beamlines to conduct their experiments.
- Supporting the beamlines to achieve operational excellence by following up beamline operation, commissioning and development tasks.
- Maintaining and developing the highly specialized scientific data acquisition and controls framework MXCuBE-Web.
- Improving the user experience of the control system web interfaces.

Senior Technological Development Analyst | CNPEM, Campinas, SP

Control Software Group (2023 - 2025)

- Engineer web applications for accelerator control using React, Next.js, and tRPC
- Lead infrastructure migration to CI/CD framework

Full-Time Role (2020 - 2023)

- Advanced image processing projects, migrating legacy desktop apps to web platforms
- Implemented software best practices including CI/CD and code review processes

Scientific Computing Intern (2019 - 2020)

- Developed image processing and reconstruction algorithms using Python and CUDA

Key Projects

Pianno

- Developed web-based drawing tool for Pimega detector alignment
- **Tech:** React, Next.js, Pixi.js, Node.js, Docker

Quasars

- Extended Orange suite with spectroscopy and SNOM data analysis tools
- **Tech:** Python, Numpy, Scipy, Pandas, Orange3, Unittest

DeepSirius UI

- Built web UIs for deep learning pipelines in image segmentation
- **Tech:** React, Next.js, Auth.js, tRPC, PostgreSQL, Python, Docker

Sophys Web

- Monorepo of web apps and packages to interact with EPICS based control systems using Bluesky utilities
- **Tech:** React, Next.js, Auth.js, tRPC, Docker, Kafka, EPICS, Bluesky, Turborepo

Education

B.S. Applied Mathematics | University of Campinas (2016 - 2020)

- Mathematical modeling, numerical analysis, scientific computing

Technical Skills

- **Core:** Python, React, Next.js, TypeScript, C/C++, CUDA, Scientific Computing

- **Supporting:** Git, Linux, CI/CD, Docker, Kubernetes, PostgreSQL, Node.js, Deno, Bun

Publications

- Alternative Fan-Beam Backprojection and Adjoint Operators (2023)
- Annotat3D: Interactive Segmentation for Volumetric Images (2022)
- RemoteVis: Efficient Visualization with NVIDIA Index (2022)

Languages

Portuguese (Native), English (Advanced), Japanese (N4)